

WHAT IS CLAIMED IS:

1. A switching power supply controller comprising:

duty ratio generating means for detecting a duty
5 ratio of a drive signal for controlling a switching
element of a switching power supply and generating a
signal corresponding to the duty ratio;

control signal generating means for generating a
control signal on the basis of a difference between a
10 target voltage in the switching power supply and an
output voltage detected in the switching power supply;

operation means for generating a signal
corresponding to a product of the signal corresponding
to the duty ratio, and the control signal; and

15 drive signal generating means for generating the
drive signal on the basis of the signal generated by
the operation means.

2. The switching power supply controller
according to Claim 1, wherein the control signal
20 generating means comprises phase compensation means for
carrying out a process for compensating for a phase in
the switching power supply controller, for the
difference.

3. The switching power supply controller
25 according to Claim 1, wherein the control signal
generating means comprises gain adjustment means for

carrying out a process for adjusting a gain in the switching power supply controller, for the difference.

4. The switching power supply controller according to Claim 1, comprising gain adjustment value setting means for setting a gain adjustment value on the basis of the signal corresponding to the duty ratio and the output voltage detected in the switching power supply,

wherein the operation means generates a signal corresponding to a product of the gain adjustment value and the control signal.

5. The switching power supply controller according to Claim 4, comprising output voltage averaging means for obtaining an average of output voltages detected in the switching power supply,

wherein the gain adjustment value setting means sets the gain adjustment value on the basis of the signal corresponding to the duty ratio and the average output voltage obtained by the output voltage averaging means.

6. The switching power supply controller according to Claim 1, comprising gain adjustment value setting means for setting a gain adjustment value on the basis of the signal corresponding to the duty ratio, and the target voltage in the switching power supply,

wherein the operation means generates a signal corresponding to a product of the gain adjustment value and the control signal.

7. The switching power supply controller according to Claim 6, wherein the duty ratio generating means comprises duty ratio averaging means for obtaining an average of said duty ratios detected, and

wherein the gain adjustment value setting means sets the gain adjustment value on the basis of the average duty ratio obtained by the duty ratio averaging means and the target voltage in the switching power supply.

8. The switching power supply controller according to Claim 7, wherein the duty ratio averaging means is a low-pass filter.

9. The switching power supply controller according to Claim 1, wherein the duty ratio generating means comprises a counter, and

wherein the counter performs a counting operation every given time to detect an on period of the switching element in the drive signal.

10. The switching power supply controller according to Claim 1, wherein the duty ratio generating means comprises a delay device, and

wherein the delay device holds the signal generated by the operation means, for a predetermined

time.

11. The switching power supply controller according to Claim 1, comprising integration control means for integrating the difference between the target
5 voltage in the switching power supply and the output voltage detected in the switching power supply to generate an integration control value,

wherein the duty ratio generating means is comprised of the integration control means and wherein
10 the integration control value generated by the integration control means is the signal corresponding to the duty ratio.

12. The switching power supply controller according to Claim 4, wherein the gain adjustment value
15 setting means comprises a divider, and

wherein the divider divides the signal corresponding to the duty ratio generated by the duty ratio generating means, by the output voltage detected in the switching power supply, or by the average output
20 voltage obtained by the output voltage averaging means to set the gain adjustment value.

13. The switching power supply controller according to Claim 6, wherein the gain adjustment value setting means comprises a divider, and

25 wherein the divider divides the signal corresponding to the duty ratio generated by the duty

ratio generating means, by the target voltage in the switching power supply to set the gain adjustment value.

5 14. The switching power supply controller according to Claim 4, wherein the gain adjustment value setting means comprises converting means and a multiplier,

10 wherein the converting means sets a conversion value for the output voltage detected in the switching power supply, or the average output voltage obtained by the output voltage averaging means, and

15 wherein the multiplier multiplies the signal corresponding to the duty ratio generated by the duty ratio generating means, by the conversion value set by the converting means, to set the gain adjustment value.

 15. The switching power supply controller according to Claim 6, wherein the gain adjustment value setting means comprises converting means and a multiplier,

20 wherein the converting means sets a conversion value for the target voltage in the switching power supply, and

25 wherein the multiplier multiplies the signal corresponding to the duty ratio generated by the duty ratio generating means, by the conversion value set by the converting means, to set the gain adjustment value.

16. The switching power supply controller according to Claim 14, wherein the converting means sets the conversion value which linearly decreases against the output voltage detected in the switching power supply, or the average output voltage obtained by the output voltage averaging means.

17. The switching power supply controller according to Claim 15, wherein the converting means sets the conversion value which linearly decreases against the target voltage in the switching power supply.

18. A switching power supply comprising:

a controller for generating a drive signal for switching control of a switching element; and

a switching element adapted to turn on and off on the basis of the drive signal generated by the controller,

wherein said controller is the controller as set forth in Claim 1.